SIEMENS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Inventors:	W. Friedrich et al.	)	Group Art Unit:	2628
		)		
Serial No.:	10/578,940	)	Examiner:	Good Johnson, Motilewa
		)		
Filed:	05/09/2006	)	Confirmation No.:	5145

Title: SYSTEM AND METHOD FOR CARRYING OUT AND VISUALLY
DISPLAYING SIMULATIONS IN AN AUGMENTED REALITY

Mail Stop Appeal Brief – Patent
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPELLANTS' BRIEF UNDER 37 CFR 41.37

Sir:

This brief is in furtherance of the Notice of Appeal filed in this application on 1 April
2010.

1. REAL PARTY IN INTEREST - 37 CFR 41.37(c)(1)(i)

The real party in interest in this Appeal is the assignee of the present application, Siemens
Aktiengesellschaft.

2. RELATED APPEALS AND INTERFERENCES - 37 CFR 41.37(c)(1)(ii)

There is no other appeal, interference or judicial proceeding that is related to or that will directly affect, or that will be directly affected by, or that will have a bearing on the Board's decision in this Appeal.

3. STATUS OF CLAIMS - 37 CFR 41.37(c)(1)(iii)

Claims cancelled: 1 – 28 and 33 - 36.

Claims withdrawn but not canceled: None.

Claims pending: 29 - 32.

Claims allowed: none.

Claims rejected: 29 - 32.

The claims on appeal are 29 - 32. A copy of the claims on appeal is attached hereto in the Claims Appendix. Appellants respectfully appeal the final rejection of claims 29 - 32.

4. STATUS OF AMENDMENTS - 37 CFR 41.37(c)(1)(iv)

In response to the Final Office Communication mailed 4 January 2010, Appellants filed a Response without amendment to the claims under 37 CFR 1.116 on 25 February 2010, requesting removal of the rejection. The Advisory Action mailed 11 March 2010 indicates that the argument presented in that Response did not change the status of the rejected claims.

5. SUMMARY OF THE CLAIMED SUBJECT MATTER- 37 CFR 41.37(c)(1)(v)

With reference by page and line numbers to the detailed description, and with reference to the figures, the following summarizes one or more exemplary embodiments described in the Specification and which are covered by specific claims, but it is to be understood that the claims are not so limited in scope.

5A. CONCISE EXPLANATION OF SUBJECT MATTER DEFINED IN INDEPENDENT
CLAIM 29

   With reference generally to Figures 1 and 2, **independent claim 29** is directed to a
method for performing a simulation in an industrial automation system 11 for observation by at
least one user 2. See page 6, lines 3 - 6. According to the method, a real component (active
lifting table 11) of the industrial automation system is placed under the control of a process
controller 14 (page 8, lines 4 - 11), the real component 11 having a process setting determinable
by input of a process value via a process link 17 (page 8, lines 19 - 26). Exemplary are sensor
and actuator values which may be read from a storage medium 13.

   A process interface 24 is provided in the automation system 11 for receiving input from
the process link 17 and is connected for setting the real component 11 in accord with the process
value. See again page 8, lines 19 - 26. The real component 11 is controlled via the process
controller 14 and the process link 17, wherein the real component forms part of a real
environment. Page 8, lines 4 - 26.

   A mixed virtual/real environment (e.g., the combination of the real lifting table 11 and
the virtual 18a and 18b) is provided for presentation to the user of a dynamic simulation in a
context which includes the real component in the real environment by augmenting the real
environment with a simulated dynamization (see page 2, lines 21 - 32), thereby providing the
user with a dynamic simulation in the context of the real environment (page 9, line 15 - page 10,
line 4; page 10, lines 6 - 14), wherein ongoing processes running in the real environment are
recorded (page 9, line6) and synchronized with the dynamic simulation (page 9, lines 7 - 8), and
wherein execution of the dynamic simulation is controllable by the user (page 9, line 8).

6. GROUNDS OF REJECTION TO BE REVIEWED UPON APPEAL - 37 CFR 41.37(c)(1)(vi)

   Whether claims 29 - 32 are each unpatentable under 35 U.S.C. Section 102 as anticipated
by Dempski (U.S. 7,050,078).

7. ARGUMENT 37 CFR 41.37(c)(1)(vii)

Appellants urge that patentability of each appealed claim should be separately considered. General argument, based on deficiencies in the rejection of independent claim 29 under Section 102 demonstrates patentability of all dependent claims. However, none of the rejected claims stand or fall together because each dependent claim further defines a unique combination that patentably distinguishes over the art of record. For this reason, to the extent the dependent claims are each argued separately, the Board is requested to consider each argument presented with regard to each dependent claim. Argument demonstrating patentability of each dependent claim is presented under subheadings identifying each claim by number.

7A. OVERVIEW OF ARGUMENT

All of the claims have been newly rejected in the final office action under Section 102 based on the Dempski reference. An issue raised in the final rejection, but which was subsequently explained in the Advisory Action mailed 11 March 2010, relates to the difference between presentation of static and dynamic virtual representations in an augmented reality system. The claimed method makes it possible to visually present dynamic simulations in the context of a real environment (see paragraph [00043] at page 10 of the application) while, at best, the prior art (Dempski) provides for placement of an image of an object (e.g., a computer generated virtual image 112, such as a text annotation), in registration with the image of a real object "so that the virtual image 112 virtually simultaneously tracks the selected object as the object and/or viewer 116 moves within the real-world environment. See Dempski at col. 7, lines 1 - 43.

As described at paragraph [00034] on page 8 of the application, in an embodiment of the invention covered by claim 29 a simulation system 7 can be accessed and a real process (e.g., an active lifting table 11) can be controlled. In the disclosed embodiment an application controller provides access to the simulation system and control over the real process. With this arrangement, as further described at page 9, for each of two modes (process active and process passive) there is a simulated dynamization of the virtual components overlaid on the real environment. For example, a processing unit 8 may link virtual image information and

environment information (e.g., real information) into a new volume of data which can be displayed with the aid of a reproduction unit 10. See page 6 of the application. Processes running in the real environment are recorded and synchronized with the dynamic simulation. See page 10, lines 11 - 12. In contrast to this, the prior art does not disclose a simulation. The mere overlay of a virtual image (such as a text box) is not a simulation. Rather, a simulation is a representation of a system through the use of another system (such as a computer simulation system). The mere generation of a virtual image of text, as an overlay, is not a simulation.

Also, a rejection under Section 102 must identify each element of the claim with as much specificity as provided in the language of the claim. It is well established that to reject a claim all of the claimed features must be identified in the prior art.

The final office action fails to meet the requirements for sustaining the rejection of all claims and applicants have been forced to appeal unsubstantiated new grounds of rejection presented in the final office action. The rejection is no more than an attempt to blur the distinction between the prior art use of virtual objects in a display and the inventive integration of a dynamic simulation into a real environment.

7B. APPELLANTS TRAVERSE THE REJECTION OF INDEPENDENT CLAIM 29 UNDER 35 U.S.C. SECTION 102.

Appellants respectfully disagree with application of the Dempski reference to reject independent claim 29 under Section 102 because that claim, directed to method for performing a simulation in an industrial automation system, requires

placing a real component of the industrial automation system under the control of a process controller, the real component having a process setting determinable by input of a process value via a process link;

The rejection cites the Dempski reference at col. 5, lines 16 - 43 for disclosing this feature. Appellants disagree. The passage says nothing about "placing a real component of the industrial automation system under the control of a process controller ..." Nor is there disclosure in the citation for "a process setting determinable by input of a process value via a process link ..." The rejection argues that there is disclosure of "capturing a real object with video images"

apparently because the real object is processed and registered by a computer. See page 2 of the final office action. This argument is error. By analogy, if one were to make a video recording of a process and perform a registration of the imaged data relative to a coordinate system, this is not the same as placing the component under the control of a process controller. Rather, it is only providing for a display of an image. By contrast, reference is made to Appellants' exemplary application controller 14 and process link 17 which are used to <u>control the real process</u> as stated at paragraphs [00034] and [00036] on page 8 of the application. Specifically, as explained at paragraph [00040] and [00041] on page 9, in the process active mode the real components are accessed via the controller and the process link for a dynamization of the reality, i.e., providing active control over the dynamic activities of the real environment. For these reasons the rejection under Section 102 is in error.

Claim 29 further requires

providing a process interface in the automation system for receiving input from the process link and connected for setting the real component in accord with the process value ...

and the rejection can only read this recitation on the prior art by essentially ignoring the requirement that the received input is "for setting the real component in accord with the process value ..." That is, the citation to col. 7, lines 44 - 57 of Dempski concerns an ability to display data (i.e., a virtual image of test data) based on a request from a viewer of an object 108. This has nothing to do with setting a process value, e.g., with the controller 14.Thus, for an additional reason the rejection under Section 102 is in error.

Claim 29 also requires

controlling the real component via the process controller and the process link, wherein the real component forms part of a real environment;

The cited passages from the Dempski reference (col. 7, lines 58-62 and col. 8, lines 7-17) have no relation to the above recitation and provide absolutely no support for anticipation thereof. This is a third reason has for overturning the rejection.

Claim 29 still further requires

providing a mixed virtual/real environment for presentation to the user of a **dynamic simulation in a context** which includes the real component in the real environment by augmenting the real

environment with **a simulated dynamization**, thereby providing the user with a **dynamic simulation** in the context of the real environment, wherein *ongoing processes running in the real environment are recorded and synchronized with the dynamic simulation*, and *wherein execution of the dynamic simulation is controllable by the user*.

The rejection argues that these features are disclosed by text at col. 7, lines 21-43, col. 1, lines 58 - 67, and col. 8, lines 18 - 54. It is submitted that none of these citations support a case of anticipation because they all lack disclosure of a simulated dynamization, and they lack disclosure of a synchronization between ongoing processes and the dynamic synchronization, and they lack disclosure of user controllable execution of the dynamic simulation.

In summary, none of the elements of claim 29 are present in the Dempski reference and the rejection must be overturned.

7C. APPELLANTS TRAVERSE THE REJECTION OF EACH CLAIM 30, 31 AND 32 WHICH DEPENDS FROM CLAIM 29 UNDER 35 U.S.C. SECTION 102.

7C(1) THE REJECTION OF CLAIM 30 IS IN ERROR

According to claim 30, the mixed virtual/real environment is displayed to the user by generating a volume data set representing the virtual objects and the real component. The citations made in the rejection (col.1, lines 33-36 and col. 8, lines 55-64) simply do not disclose the recited subject matter and the Examiner cannot carry the burden of showing otherwise.

7C(2) THE REJECTION OF CLAIM 31 IS IN ERROR

Claim 31 requires, among other features, that, while under the control of the process controller, the real component receives actuator values having a process setting determinable by input of a process value via a process link. The rejection does not attempt to find the features of this recitation. Other features of claim 31 are also absent from the prior art.

7C(3) THE REJECTION OF CLAIM 32 IS IN ERROR

The method of claim 32 further includes

recording data during the ongoing simulated dynamization to enable playback of the recorded dynamization in slow motion and in a backwards direction in time.

The rejection cites col. 8, lines 18 - 36 of Dempski, but the citation is devoid of disclosure relating to any playback in slow motion and in a backwards direction in time. Further, there is no disclosure of a recorded dynamization. The rejection must be overturned.

7D. CONCLUSION

Argument has been presented to demonstrate that the rejections under Section102 are deficient and that the dependent claims distinguish over the prior art. The Examiner has argued rejections when claimed features are absent from or inconsistent with the applied combinations of art. Accordingly, none of the rejections can be sustained. For all of the above argued reasons, all of the rejections should be withdrawn and the claims should be allowed.

8. APPENDICES

An appendix containing a copy of the claims involved in this appeal is provided herewith. No evidence appendix or related proceedings appendix is provided because no such evidence or related proceeding is applicable to this appeal.

Respectfully submitted,

Dated: _0 6 /09 /10_   By:_____

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APPENDIX OF CLAIMS ON APPEAL

29. A method for performing a simulation in an industrial automation system for observation by at least one user, comprising:

placing a real component of the industrial automation system under the control of a process controller, the real component having a process setting determinable by input of a process value via a process link;

providing a process interface in the automation system for receiving input from the process link and connected for setting the real component in accord with the process value; controlling the real component via the process controller and the process link, wherein the real component forms part of a real environment; and

providing a mixed virtual/real environment for presentation to the user of a dynamic simulation in a context which includes the real component in the real environment by augmenting the real environment with a simulated dynamization, thereby providing the user with a dynamic simulation in the context of the real environment, wherein ongoing processes running in the real environment are recorded and synchronized with the dynamic simulation, and wherein execution of the dynamic simulation is controllable by the user.

30. The method in accordance with claim 29, wherein the mixed virtual/real environment is displayed to the user by generating a volume data set representing the virtual objects and the real component.

31. The method in accordance with claim 30, wherein while under the control of the process controller, the real component receives actuator values having a process setting determinable by input of a process value via a process link, and provides one or more sensor values associated with one or more states of the component during operation, the method further including:

storing the sensor and actuator values for the real component; and

for provision of the mixed virtual/real environment with the simulated dynamization, providing the sensor and actuator values to perform modifications to the ongoing simulated dynamization.

32. The method in accordance with claim 29, further including recording data during the ongoing simulated dynamization to enable playback of the recorded dynamization in slow motion and in a backwards direction in time.

EVIDENCE APPENDIX - 37 CFR 41.37(c) (1) (ix)

None

RELATED PROCEEDINGS APPENDIX - 37 CFR 41.37(c) (1) (x)

None